1,147,049

PATENT SPECIFICATION

DRAWINGS ATTACHED

1,147,049

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Int. Cl.:—H 01 f 27/08.

COMPLETE SPECIFICATION

Improvements in and relating to Transformer Windings

We, C. A. Parsons & Company Limited, of Heaton Works, Newcastle upon Tyne 6, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to transformer windings.

Heat is dissipated from the coils forming the windings of transformers *via* external surfaces of the coils and where necessary from additional surfaces provided within the body of the coil. Spacers of electrically insulating materials are commonly located within the coils to provide spaces through which a coolant can flow. Generally speaking such spacers must be positioned in the coil during the winding operation and this adds to the complexity of the winding operation.

The object of the invention is to provide improvements in connection with the cooling of transformer windings.

The present invention comprises a transformer winding in which cooling ducts within coils constituting the winding are formed by convolutions as herein defined in the conductors.

The invention also consists in a transformer winding in accordance with the preceding paragraph in which a conductor forming a winding of said transformer has convolutions as herein defined over part of its length which part in conjunction with turns formed by non-convoluted portions of the conductor define axial cooling ducts in the winding.

The invention also consists in a transformer winding in accordance with either of the preceding two paragraphs in which the edges of the conductors forming a winding of said transformer have convolutions as herein defined said convolutions defining radial cooling ducts in the winding.

The invention also consists in a transformer winding substantially as described herein-below with reference to the drawings accompanying the Provisional Specification in which drawings:—

Figure 1 shows an end view of a winding of a transformer constructed in accordance with one form of the present invention.

Figure 2 is a perspective view of part of the winding of Figure 1.

In carrying the invention into effect in the form illustrated in Figures 1 and 2 by way of example a winding for a transformer is formed by a conductor 1 which has convolutions 1*a* extending over part of its length. The term 'convolution' is used herein to include not only conductors having folds therein or of sinuous form but conductors which have undulating surfaces. The winding is formed by winding the conductor in the conventional manner and the convoluted portions with non-convoluted portions of the conductor forming neighbouring turns, constitute axial cooling ducts 2 for the winding. The use of separate spacers to form the ducts is thereby eliminated.

Radial ducts can be formed by making convolutions in the surface or surfaces of the conductor or conductors.

The winding may be formed by a series of disc coils, or may be a layer winding.

The length of the convoluted portions can be chosen to provide the necessary cooling duct area and they may be located at different radii throughout the winding. Instead of the cooling ducts being formed by convoluted portions and non convoluted portions of the conductors, the convoluted portions themselves may be arranged so that they form consecutive turns with the con-

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volutions of one turn bearing against the convolutions of adjacent turns to form the desired ducts.

WHAT WE CLAIM IS :—

1. A transformer winding in which cooling ducts within coils constituting the winding are formed by convolutions as herein defined in the conductors.

2. A transformer winding as claimed in Claim 1 in which a conductor forming a winding of said transformer has convolutions as herein defined over part of its length which part in conjunction with turns formed by non-convoluted portions of the conductor define axial cooling ducts in the winding.

3. A transformer winding as claimed in Claim 1 or Claim 2 in which the edges of the conductors forming a winding of said transformer have convolutions as herein defined said convolutions defining radial cooling ducts in the winding.

4. A transformer winding substantially as described herein-above with reference to the drawings accompanying the Provisional Specification.

MARKS & CLERK,
Chartered Patent Agents,
Agents for the Applicants.

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1 SHEET

PROVISIONAL SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.

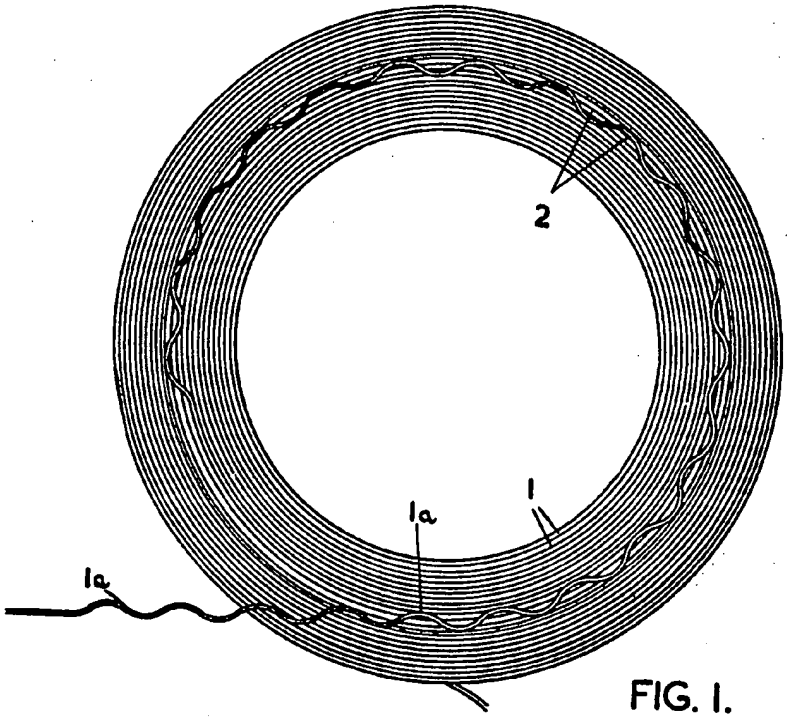

FIG. 1.

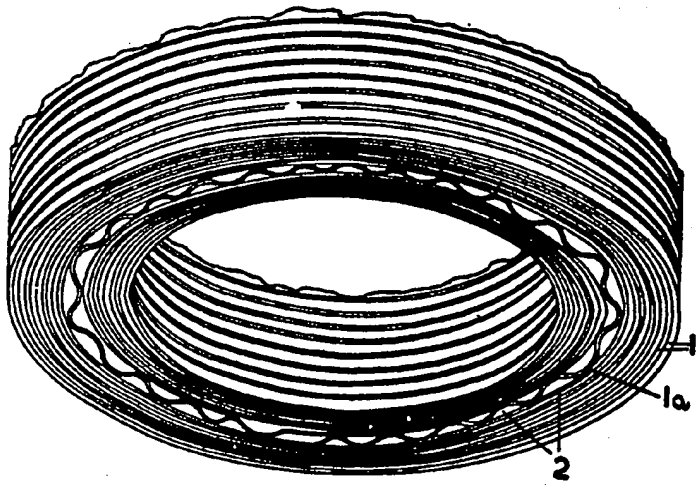

FIG. 2.